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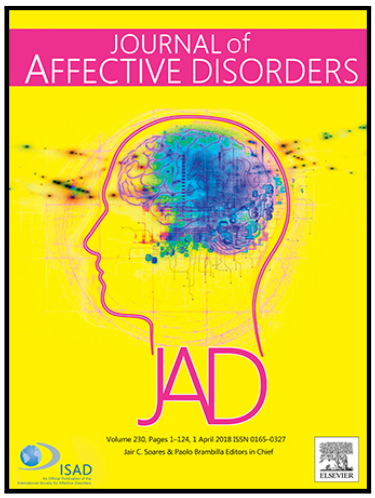

The association between a history of self-harm and mental disorders in pregnancy

Catherine MacLeod Hall , Emma Molyneaux , Hannah Gordon , Kylee Trevillion , Paul Moran , Louise M Howard

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Highlights

- *Women reporting a history of self-harm had greater risk of antenatal mental disorders*
- *Antenatal anxiety disorders were particularly common among these women*

The association between a history of self-harm and mental disorders in pregnancy

Catherine MacLeod Hall[*], Emma Molyneaux[*1], Hannah Gordon, Kylee Trevillion, Paul Moran, Louise M Howard

* Joint first authors

1: Corresponding Author.
Phone: 020 7848 8498 Email: emma.molyneaux@kcl.ac.uk

Section of Women's Mental Health, PO 31
Health Service and Population Research Department
Institute of Psychiatry, Psychology & Neuroscience, King's College London

De Crespigny Park
London SE5 8AF

Background: Self-harm is prevalent, particularly among young women, and is associated with mental disorders. However, little is known about the mental health of pregnant women who have a history of self-harm. This study examined whether lifetime self-harm was associated with increased risk of antenatal mental disorders.

Methods: Cross-sectional study of 544 pregnant women recruited after their first antenatal appointment, oversampling those who responded positively to the depression-screening Whooley questions. The Structured Clinical Interview for DSM-IV-TR was delivered, including questions about the lifetime occurrence of self-harm. The associations between lifetime self-harm and the presence of mental disorders, and more specifically anxiety and depressive disorders, were examined using survey-weighted logistic regression. The association between lifetime self-harm and symptoms of personality disorder, was investigated using survey-weighted linear regression.

Results: After survey weighting, history of self-harm had a prevalence of 7.9% (95%CI 5.5-11.2%) and was associated with increased risk for mental disorders in early pregnancy

(adjusted odds ratio [AOR] 5.03; 95%CI: 2.22-11.37; p<0.0001; n=517). Women with a history of self-harm were more likely to experience antenatal anxiety disorders (AOR 4.41; 95%CI: 1.85-10.51; p=0.001; n=517) and antenatal depression (AOR 2.71; 95%CI: 1.04-7.05; p = 0.042; n=517) than women who did not report self-harm. History of self-harm was also associated with higher SAPAS scores (adjusted coefficient 0.69; 95%CI: 0.21-1.17; n=517). **Limitations:** Information on the timing and persistence of self-harm was not available. **Conclusions:** Women with a history of self-harm are more vulnerable to mental disorders in pregnancy. Further research should include more comprehensive assessments of self-harm and the social context of pregnant women.

Introduction

Mental health problems are common during pregnancy (Howard, Molyneaux et al. 2014) - over one-in-four women meet diagnostic criteria for a mental disorder in early pregnancy, with anxiety disorders and depression being the commonest conditions (Howard et al., 2018). As well as the morbidity experienced by the mother, maternal mental disorders may be associated with obstetric complications (Accortt et al., 2015) and developmental difficulties in the offspring (Stein et al., 2014).

The prevalence of self-harm is increasing and is particularly common among young women (McManus et al., 2016; Morgan et al., 2017). Risk factors for self-harm include negative life events, such as physical or sexual abuse, as well as sociodemographic and psychological factors (Hawton et al., 2012; Maniglio 2011). Self-harm is associated with mental disorders in the general population (Bentley et al., 2015; Hawton et al., 2012) and adolescent self-harm has been associated with ongoing psychosocial problems into adulthood (Borschmann

et al., 2017). However, very little is known about whether a history of self-harm is associated with increased vulnerability to mental disorders during pregnancy. One recent study identified that self-harm in young adulthood was associated with self-reported depressive symptoms during pregnancy and the postnatal period (Borschmann et al., 2018), however no data were available to examine whether women were more likely to meet diagnostic criteria for depression, and whether they were more likely to experience other mental health problems during pregnancy (e.g. anxiety). Our study therefore examines the relationship between self-reported history of self-harm and meeting diagnostic criteria for depression, anxiety and other mental disorders during pregnancy.

Methods

Study population

This study used baseline data from the WENDY cohort study (see Howard et al., 2018 for more details), which recruited women booking for antenatal care at an inner-London maternity service between November 2014 and June 2016. The Whooley depression screening questions (Whooley et al., 1997) were asked by midwives at booking and responses were recorded electronically. All Whooley positive women (i.e. those answering yes to either one or both items of the Whooley) and a random sample of Whooley negative women were approached to participate in this study. Exclusion criteria were age <16, no recorded response to the Whooley questions, a previous comprehensive maternity booking elsewhere in the UK, and a termination or miscarriage between the booking appointment and research interview. Women who agreed to participate were interviewed by researchers within three weeks of their antenatal booking appointment. Written informed consent was obtained from all women.

Study Measures

Structured Clinical Interview for DSM-IV: Trained researchers delivered the Structured Clinical Interview DSM-IV-TR [SCID] Axis I Mood Disorders and Anxiety Disorders modules; SCID Axis I Eating Disorders module, and SCID-II Personality Disorders sub-section for borderline personality disorder (First et al., 1997, 1995). The SCID is the gold standard diagnostic assessment for mental disorders. The interview includes questions about lifetime history of self-harm, including "Have you tried to hurt or kill yourself or ever threatened to do so?" (Borderline Personality Disorder sub-section), with a follow up prompt, "Have you ever cut, burned, or scratched yourself on purpose?" Any reported act of deliberate self-harm (with or without suicidal intent) was recorded as a history of self-harm for this study, regardless of whether this occurred in the context of a mental disorder.

The Standardised Assessment of Personality – Abbreviated Scale (SAPAS): The SAPAS is an eight item screening tool designed to identify individuals with a possible DSM personality disorder (Moran et al., 2003). The SAPAS was used a continuous variable in analyses, with higher scores indicated greater presence of personality difficulties. It is presented as a categorical variable using a validated cut-off ≥3 (Moran et al., 2003) for ease of interpretation when describing sample characteristics.

Sociodemographic characteristics: Data were obtained on socio-demographic characteristics, including age, ethnicity, highest qualification, relationship status, employment, place of birth and number of living children.

Statistical Analysis

Statistical analyses were performed in Stata 14.1 (StataCorp, 2007). Demographic characteristics are reported as unweighted data, and all other reported analyses refer to survey weighted data to account for the over-sampling of Whooley positive and under-sampling of Whooley negative women in the study. There was very little missing data in the analysis variables. Regression analyses were conducted only including participants with complete data on all relevant outcomes and covariates.

Logistic regression was used to examine the relationship between history of self-harm and meeting diagnostic criteria for a) any mental disorder, b) depressive disorders, and c) anxiety disorders. The category 'any mental disorder' included all current disorders evaluated in the baseline interview: anxiety disorders (panic disorder, agoraphobia, social phobia, specific phobia and generalised anxiety disorder), depressive disorders (major depressive disorder, depressive episodes and mixed anxiety-depressive disorder), and bipolar disorder, obsessive compulsive disorder (OCD), post-traumatic stress disorder (PTSD), current acute stress disorder, anorexia nervosa, bulimia nervosa, binge eating disorder and borderline personality disorder. These were grouped for analysis as the prevalence of disorders such as eating disorders and PTSD were too low in the current sample to examine these as separate outcomes. The three logistic regression analyses were then repeated adjusting for confounders: age, ethnicity, education and whether participants were born in the UK. The relationship between history of self-harm and SAPAS score was assessed using linear regression and adjusted for the confounders stated above.

Ethical Approval

The research was approved by the National Research Ethics Service, London Committee - Camberwell St Giles (ref no 14/LO/0075).

Results

545 women participated in the study (see Appendix 1 and Howard et al., 2018 for details of recruitment). Of these, 544 women (99.8%) had data on history of self-harm and were included in the analyses for this paper. The majority of participants had complete data for all other analysis variables, however 21 women (3.9%) had missing data for PTSD, four (0.7%) for the SAPAS, and one (0.2%) for each of major depressive disorder, general anxiety disorder and specific phobia.

Within the sample, 76 women reported a history of self-harm. Based on survey weighting, the population prevalence estimate for self-harm was therefore estimated to be 7.9% (95%CI 5.5-11.2%). Unweighted sample characteristics are shown in Table 1. Women reporting a history of self-harm were younger than women without a history of self-harm (23.7% vs. 8.1% aged 16-24 years) and were more likely to have been born in UK (67.1% vs. 44.9% of women without a history of self-harm). Other socio-demographic characteristics were similar for women with and without a history of self-harm.

Population prevalence estimates for mental disorders were calculated using survey weighting. Among women with a history of self-harm, 57.2% (95%CI: 37.9-74.6%) met diagnostic criteria for any mental disorder, compared with 20.8% (95%CI: 16.6-25.8%) of those without a history of self-harm. The prevalence of anxiety disorders was 44.7% (95%CI: 27.5-63.4%) for women with a history of self-harm, and 12.4% (95%CI: 9.1-16.5%) for those

without. Depressive disorders affected 20.3% (95%CI: 10.3-36.0%) of those with a history of self-harm compared with 8.9% (95%CI: 6.7-12.2%) of those without.

The relationship between a history of self-harm and mental diagnoses was then examined (see Figure 1).Women who had a history of self-harm had over five times higher odds of currently meeting diagnostic criteria for a mental disorder (OR: 5.03; 95%CI: 2.22-11.37; p<0.0001; n=517), with little evidence for confounding after adjusting for age, ethnicity, education and whether women were born in the UK (AOR: 4.39; 95%CI: 1.93-9.97; p<0.0001; n=517). A history of self-harm was also associated with over four times the odds of meeting criteria for antenatal anxiety disorders (unadjusted OR: 5.41; 95%CI: 2.38-12.25; p<0.0001; n=517; AOR: 4.41; 95%CI: 1.85-10.51; p=0.001; n=517) and over double the odds of meeting criteria for depressive disorders (unadjusted OR: 2.51; 95%CI: 1.04-6.07; p=0.041; n=517; AOR: 2.71; 95%CI: 1.04-7.05; p = 0.042; n=517).

The association between history of self-harm and SAPAS scores was then examined. Following survey weighting, the prevalence of high SAPAS scores (≥3; indicating greater presence of personality difficulties was 35.7% (95%CI: 20.7-54.2%) among women with a history of self-harm, compared with 14.5% (95%CI: 10.9-19.0%) among women without a history of self-harm. A history of self-harm was significantly associated with higher scores on the SAPAS, used as a continuous outcome (coefficient 0.81; 95%CI: 0.31-1.32; p=0.001; n=517), which remained significant following adjustment for confounders (coefficient 0.69; 95%CI: 0.21-1.17; n=517).

Discussion

Over half of women who reported a history of self-harm met diagnostic criteria for a mental disorder in early pregnancy, compared with one in five women who did not report previous self-harm. A history of self-harm was associated with over four times higher odds of antenatal anxiety disorders and over double the odds of antenatal depressive disorders. A history of self-harm was also associated with higher scores on the SAPAS, which indicates greater presence of personality difficulties.

Our study highlights the importance of pre-conception mental health as a predictor of perinatal mental health, in keeping with Patton et al.'s (2015) finding that 85% of women with elevated symptoms of depression during pregnancy or the postnatal period had a history of poor mental health in adolescence or early adulthood. No previous studies have examined the relationship between lifetime self-harm and diagnoses of mental disorders in pregnancy. One previous study identified that young adult self-harm was associated with higher self-reported depressive symptoms during pregnancy (Borschmann et al., 2018). Our study adds to this evidence by identifying that history of self-harm is also associated with increased risk of meeting diagnostic criteria for depression during pregnancy and provides novel evidence that history of self-harm is associated with substantially increased risk of antenatal anxiety, which has not previously been examined. The relationship between self-harm and personality difficulties has also not previously been explored among pregnant women, but a similar association has been observed in other adult samples (e.g. Shaw et al., 2012). A recent qualitative study of the experiences of 51 women from our sample, who were asked the Whooley questions at antenatal booking, found that women would also

value having discussions with their midwife which focused on past mental health experiences (Yapp et al, forthcoming).

A major strength of this study is the large representative inner-city sample, with translators used to prevent the exclusion of traditionally hard-to-reach minority groups. Participant demographics were similar to the local maternity population (Howard et al., 2018), and there was very little missing data for the majority of variables. The use of SCID diagnostic interviews to assess mental disorders in pregnancy, rather than screening tools, is a further strength.

The study also has some limitations. No information was gathered on the type, frequency, severity or crucially, on the timing of self-harm. In the study described above, Borschmann et al. (2018) identified that while women who had self-harmed as young adults reported greater perinatal depressive symptoms than those with no history of self-harm, there was no association between adolescent self-harm and perinatal depressive symptoms. Our study has complementary strengths and weaknesses with this previously published paper, as Borschmann et al.'s work provided more detailed information on the self-harm exposure, while our study enables more detailed examination of antenatal mental disorder outcomes.

A history of self-harm may relate to adversities such as childhood trauma and domestic or sexual violence victimization (Hawton et al., 2012; Maniglio 2011), which have also been associated with mental health problems in the perinatal period (Howard et al., 2013; Lyons-Ruth and Block., 1996). It is therefore crucial for future research to examine the previous experiences of pregnant women with a history of self-harm, as well as psychological and social factors which might explain the relationship between previous self-harm and poor mental health during pregnancy. Finally, future research is needed to examine the

experiences of pregnant women with other diagnoses, including bipolar disorders and eating disorders. These were of low prevalence in the current study, but represent a significant, under-researched morbidity, and may exhibit different relationships with self-harm.

Conclusion

A history of self-harm is associated with increased risk of experiencing mental disorders in early pregnancy, particularly anxiety disorders. Future studies in this area should explore risk factors for self-harm and subsequent antenatal mental disorders in more depth.

Author Declaration Statement

Conflicts of Interest:
We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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Author Contribution
Catherine Macleod Hall, Emma Molyneaux and Louise M Howard conceived and designed the analyses reported in the manuscript. Catherine Macleod Hall, Emma Molyneaux and Hannah Gordon conducted the analyses. All authors contributed to the interpretation of the data and the drafting of the manuscript.
We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

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Correspondance
We understand that the Corresponding Author is the sole contact for the Editorial process (including Editorial Manager and direct communications with the office). He/she is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs.
We confirm that we have provided a current, correct email address which is accessible by the Corresponding Author and which has been configured to accept email from emma.molyneaux@kcl.ac.uk.

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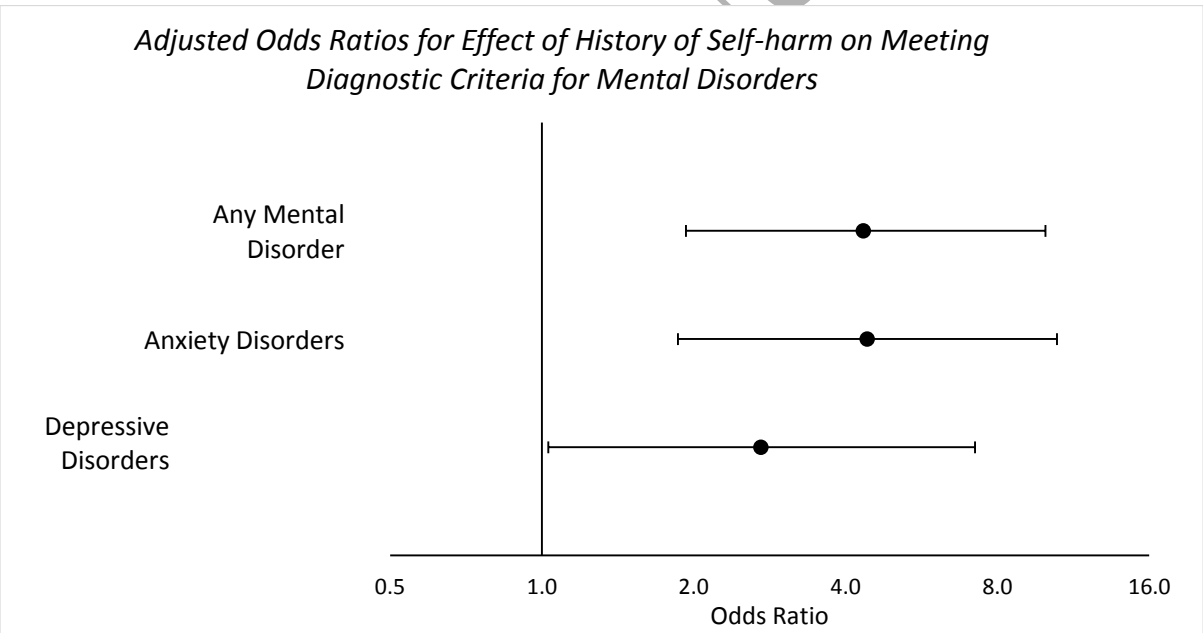
Figure 1: Adjusted odds ratio and 95% confidence intervals for the association between history of self-harm and meeting diagnostic criteria for mental disorders.



Any mental disorder included major depressive disorder, depressive episodes, mixed anxiety-depressive disorder, bipolar disorder, panic disorder, agoraphobia, social phobia, specific phobia, generalised anxiety disorder, obsessive compulsive disorder (OCD), post-traumatic stress disorder (PTSD), current acute stress disorder, anorexia nervosa, bulimia nervosa, binge eating disorder and borderline personality disorder.
Anxiety disorders included panic disorder, agoraphobia, social phobia, specific phobia and generalised anxiety disorder. OCD and PTSD were not included in this group, as these are no longer classified as anxiety disorders in DSM-5.

Depressive disorders included major depressive disorder, depressive episodes and mixed anxiety-depressive disorder. All disorders were diagnosed using the SCID diagnostic interview.

Table 1: Sociodemographic characteristics of the total sample and based on history of self-harm, using unweighted data

Characteristic		Total sample (n=544)	History of self-harm	
			Positive (n=76)	Negative (n=468) (n, %)
		(n, %)	*(n, %)*	*(n, %)*
Age				
	16-24	56 (10.3)	18 (23.7)	38 (8.1)
	25-29	101 (18.6)	18 (23.7)	83 (17.7)
	30-34	179 (32.9)	25 (32.9)	154 (32.9)
	35-39	162 (29.8)	12 (15.8)	150 (32.1)
	≥40	46 (8.5)	3 (4.0)	43 (9.2)
Ethnicity				
	White	283 (52.0)	44 (57.9)	239 (51.1)
	Black	177 (32.5)	23 (30.3)	154 (32.9)
	Asian	23 (4.2)	3 (4.0)	20 (4.3)
	Mixed	25 (4.6)	4 (5.3)	21 (4.5)
	Other	36 (6.6)	2 (2.6)	34 (7.3)
Highest Qualification [a]				
	GCSE or below	65 (12.0)	10 (13.2)	55 (11.8)
	A Level or vocational	154 (28.3)	27 (35.5)	127 (27.1)
	University degree or equivalent professional training	325 (59.7)	39 (51.3)	286 (61.1)
Relationship Status				
	Single, separated, divorced or widowed	71 (13.1)	11 (14.5)	60 (12.8)
	Partner, not cohabiting	82 (15.1)	18 (23.7)	64 (13.7)
	Cohabiting partner/married	391 (71.9)	47 (61.8)	344 (73.5)
Employment [b]				
	Paid employment	348 (64.2)	44 (57.9)	304 (65.2)
	Student	22 (4.1)	3 (4.0)	19 (4.1)
	Not working	140 (25.8)	23 (30.3)	117 (25.1)
	Other	32 (5.9)	6 (7.9)	26 (5.6)
Born in the United Kingdom				
	Yes	261 (48.0)	51 (67.1)	210 (44.9)
	No	283 (52.0)	25 (32.9)	258 (55.1)
Living Children				
	0	271 (49.8)	40 (52.6)	231 (49.4)
	1-2	245 (45.0)	33 (43.4)	212 (45.3)

	≥3	28 (5.2)	3 (4.0)	25 (5.3)

[a] The highest qualifications held by participants were recorded as General Certificate of Secondary Education (GCSE) or below, Advanced level (A level) or vocational equivalent, or University degree or equivalent professional training. GCSEs and A levels are secondary education qualifications typically at 16 and 18 respectively. [b] Employment was categorised as paid employment (full-time or part-time), student, not working (unemployed, not working due to looking after the home, or illness), and other (including answering 'other' or voluntary job). Two participants had missing data for employment.